



# GRADE 12 DIPLOMA EXAMINATION

## Biology 30

January 1989

**Alberta**  
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**GRADE 12 DIPLOMA EXAMINATION  
BIOLOGY 30**

**DESCRIPTION**

Time: 2½ hours

Total possible marks: 100

This is a **CLOSED-BOOK** examination consisting of two parts:

**PART A:** 70 multiple-choice questions each with a value of 1 mark.

**PART B:** Seven written-response questions for a total of 30 marks.

**GENERAL INSTRUCTIONS**

Fill in the information on the answer sheet as directed by the examiner.

For multiple-choice questions, read each carefully and decide which of the choices **BEST** completes the statement or answers the question. Locate that question number on the answer sheet and fill in the space that corresponds to your choice. **USE AN HB PENCIL ONLY.**

Example	Answer Sheet
This examination is for the subject area of	A   B   C   D
A. Biology	●   ②   ③   ④
B. Chemistry	
C. Mathematics	
D. Physics	

If you wish to change an answer, please erase your first mark completely.

For written-response questions, read each carefully and write your answer in the space provided in the examination booklet.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.
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**DO NOT FOLD EITHER THE ANSWER SHEET OR THE EXAMINATION BOOKLET**

The presiding examiner will collect the answer sheet and examination booklet for transmission to Alberta Education.

**JANUARY 1989**



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## **PART A**

### **INSTRUCTIONS**

There are 70 multiple-choice questions with a value of one mark each in this section of the examination. Use the separate answer sheet provided and follow the specific instructions given.

NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.

**WHEN YOU HAVE COMPLETED PART A, PROCEED DIRECTLY TO PART B**

**DO NOT TURN THE PAGE TO START THE EXAMINATION UNTIL TOLD  
TO DO SO BY THE PRESIDING EXAMINER**

## PART A

### INSTRUCTIONS

There are 70 multiple-choice questions with a value of one point each in this section of the examination. The test questions are arranged in order of increasing difficulty. Read the questions carefully and select the best answer.

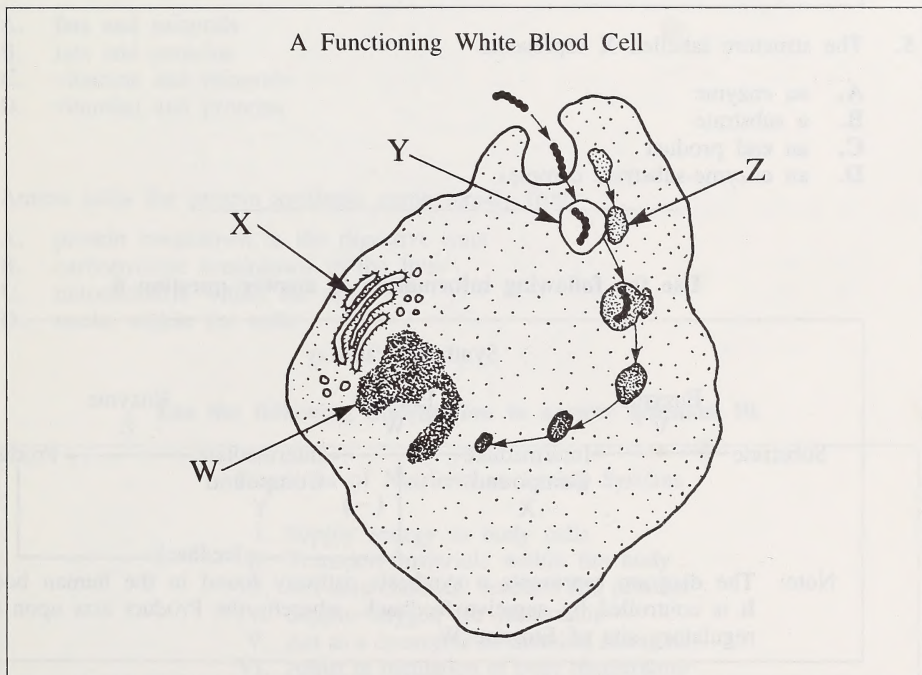
NOTE: The instructions on the back of this booklet are to be read and followed.

WHEN YOU HAVE COMPLETED PART A, PROCEED DIRECTLY TO PART B

DO NOT TURN THE PAGE TO START THE EXAMINATION UNTIL TOLD  
TO DO SO BY THE PROCTOR

1. Cellular structures that manufacture and package products for secretion are
  - A. vacuoles
  - B. ribosomes
  - C. mitochondria
  - D. Golgi bodies
2. The rate of diffusion of materials out of a cell is INDEPENDENT of the
  - A. temperature of the cell
  - B. permeability of the cell membrane
  - C. amount of ATP present in the cell membrane
  - D. concentration difference on either side of the cell membrane

Use the following diagram to answer question 3.

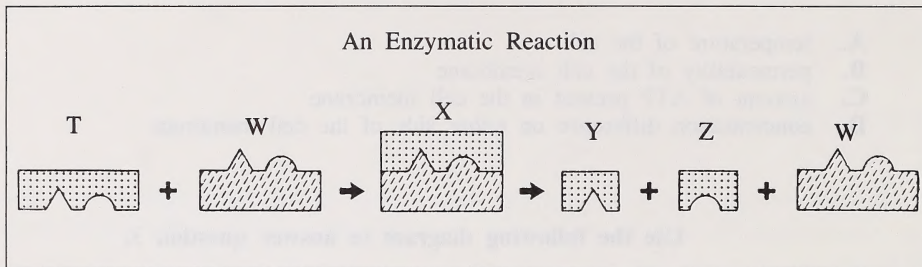


3. A lysosome is represented by the structure labelled
  - A. W
  - B. X
  - C. Y
  - D. Z



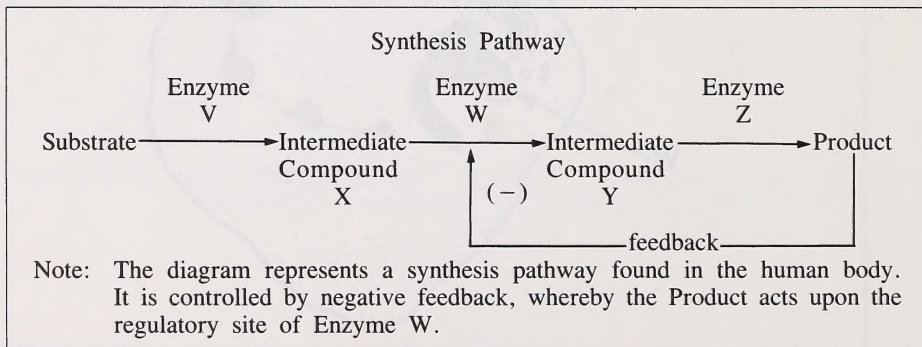
4. Competitive inhibitors prevent enzymatic action by
- denaturing the enzyme
  - breaking peptide bonds
  - binding to the active sites
  - lowering the activation energy

Use the following information to answer question 5.



5. The structure labelled X represents
- an enzyme
  - a substrate
  - an end product
  - an enzyme-substrate complex

Use the following information to answer question 6.

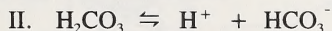
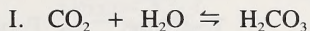


6. An increase in the concentration of the Product will be reflected FIRST by a decrease in the concentration of the
- Product
  - Substrate
  - Intermediate Compound X
  - Intermediate Compound Y



Use the following information to answer question 7.

Some carbon dioxide is transported in the plasma of the blood. As part of the process, the following reactions occur:



7. If the pH of the blood plasma that was transporting carbon dioxide remained unchanged, one might conclude that the plasma was
- A. buffered
  - B. filtered
  - C. initially very basic
  - D. initially very acidic
- 
8. In addition to glucose, cells may use supplementary energy sources such as
- A. fats and minerals
  - B. fats and proteins
  - C. vitamins and minerals
  - D. vitamins and proteins
9. Amino acids for protein synthesis come mostly from
- A. protein breakdown in the digestive tract
  - B. carbohydrate breakdown in the liver
  - C. mitochondria within the cells
  - D. nuclei within the cells

Use the following information to answer question 10.

Functions of Nutrients in Living Systems

- I. Supply energy to body cells
- II. Transport materials within the body
- III. Act as a chemical reactant and product
- IV. Supply oxygen for respiration
- V. Act as a coenzyme in chemical reactions
- VI. Assist in regulation of body temperature

10. The major functions of water in living systems are
- A. I, II, IV, and V
  - B. I, III, V, and VI
  - C. II, IV, and V
  - D. II, III, and VI
-

Use the following information to answer question 11.

During an experiment, tests were performed on four foods to detect the presence of sugar, protein, starch, and lipid.

<u>Test Tube</u>	<u>Food</u>
1	butter
2	egg white
3	candy bar
4	potato

In one test, a substance was added to each test tube and then all test tubes were heated in a hot water bath. After five minutes, it was observed that the contents of one of the test tubes had changed from a bluish-green color to a reddish-orange color.

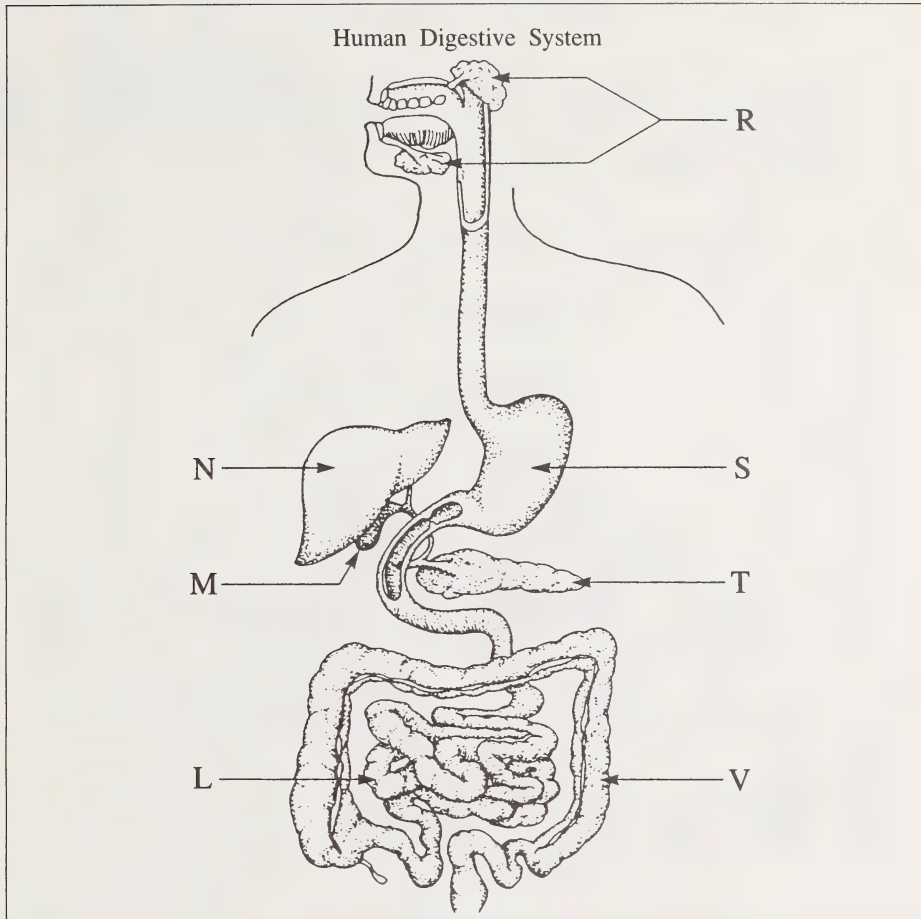
11. The substance that was added to the test tubes before they were heated was

- A. iodine
- B. Sudan IV
- C. Biuret solution
- D. Benedict's solution

12. A blocked bile duct will affect the digestion of

- A. fats
- B. sugars
- C. starches
- D. proteins

Use the following diagram to answer questions 13 and 14.



13. Two parts of the digestive system that secrete amylase are

- A. N and T
- B. N and S
- C. R and T
- D. R and S

14. Three organs that ALL play MAJOR roles in lipid digestion are

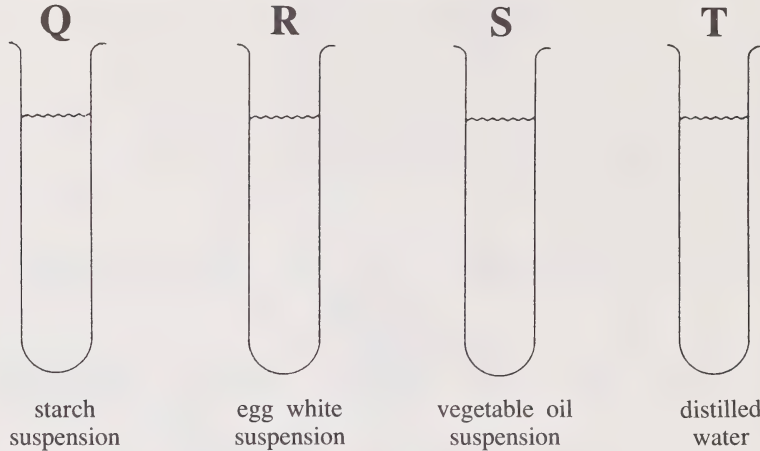
- A. L, M, and S
- B. L, M, and T
- C. M, S, and T
- D. N, T, and V



Use the following information to answer questions 15 and 16.

An Experiment to Test Enzymatic Digestion of Three Foods

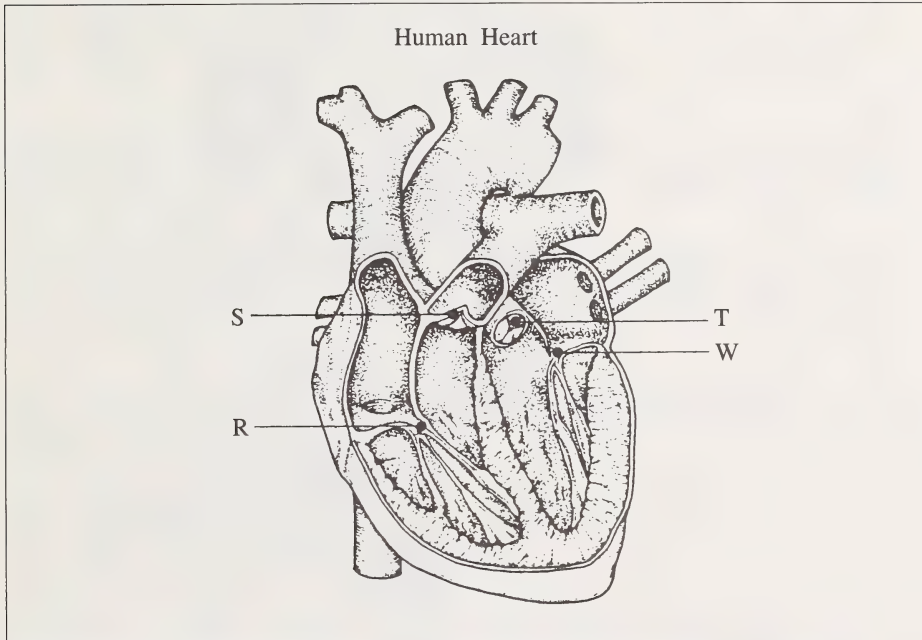
In a research laboratory a sample of enzyme solution was collected and 5 mL were added to each of four test tubes labelled Q, R, S, and T. The test tubes with the contents indicated were incubated at 37°C for the same length of time. Evidence of digestion was present in test tube R only.



15. The sample added to each of the test tubes was likely
- A. saliva
  - B. gastric juice
  - C. pancreatic juice
  - D. intestinal juice
16. The manipulated (independent) variable in this experiment is the
- A. type of food that was subjected to the test
  - B. observed amount of digestion in each test tube
  - C. temperature at which the test tubes were incubated
  - D. sample of enzyme solution that was added to each of the test tubes
- 
17. A piece of hamburger in the stomach would stimulate
- A. gastrin and insulin production
  - B. gastrin and glucagon production
  - C. peristalsis and gastrin production
  - D. peristalsis and secretin production

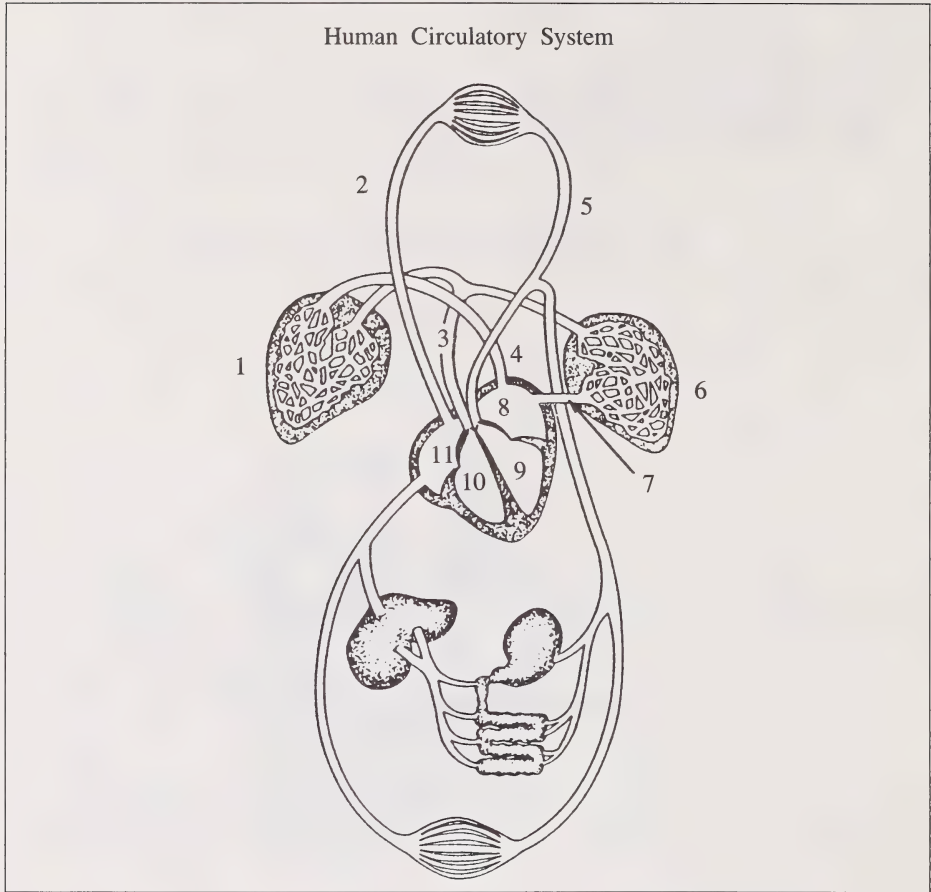
18. If the nerve fibres leading to the muscles of the small intestine are severed, the function of the digestive tract that will be affected first is the
- A. process of peristalsis
  - B. activity of the enzymes
  - C. deamination of amino acids
  - D. egestion of waste products

Use the following diagram to answer question 19.



19. Which statement correctly describes what happens to the valves in the heart when the left ventricle contracts?
- A. R and S open; T and W close
  - B. R and S close; T and W open
  - C. R and W open; S and T close
  - D. R and W close; S and T open
- 
20. Blood travelling in the pulmonary artery is
- A. oxygenated and moving toward the lungs
  - B. deoxygenated and moving toward the lungs
  - C. oxygenated and moving away from the lungs
  - D. deoxygenated and moving away from the lungs

Use the following diagram to answer questions 21 and 22.



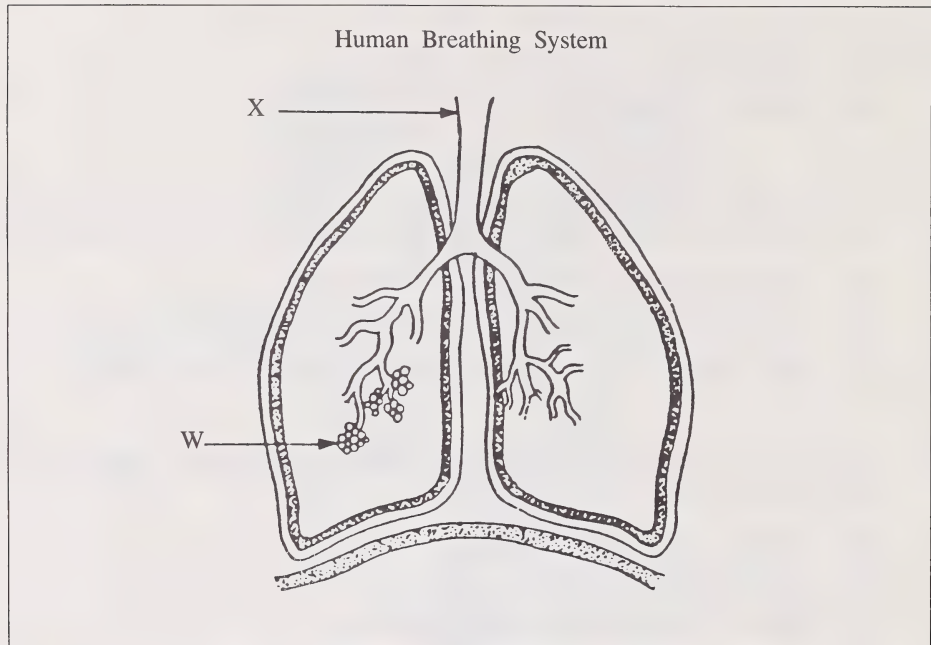
21. The correct sequence of structures involved in pulmonary circulation beginning in the right atrium is
- 8, 7, 6, 3, 10, and 11
  - 8, 9, 5, 2, and 11
  - 10, 3, 1, 4, and 8
  - 11, 10, 3, 6, 7, and 8
22. Oxygenated blood would be found in structures labelled
- 3, 11, and 10
  - 4, 8, and 9
  - 6, 11, and 10
  - 10, 3, and 4



23. Most venous blood from the lower part of the body is kept moving by the
- A. pressure of the skeletal muscles and a system of valves
  - B. force of gravity and the pressure of the heart
  - C. constriction of the venules and capillaries
  - D. return of blood to the heart
24. One function of leukocytes is to
- A. aid in the clotting process
  - B. carry oxygen to body cells
  - C. regenerate bone marrow
  - D. produce antibodies
25. If the systolic blood pressure readings change from 120 mm Hg (16.0 kPa) to 100 mm Hg (13.3 kPa), then the subsequent decrease in capillary pressures will
- A. cause a decrease in the volume of blood plasma
  - B. maintain the normal water balance because of lymph action
  - C. cause more fluid to leave the capillaries and enter the tissue spaces
  - D. cause less fluid to leave the capillaries and enter the tissue spaces
26. The substances that normally pass from the blood, through the capillary wall, and into the tissue fluid are
- A. platelets, oxygen, and glucose
  - B. oxygen, glucose, and amino acids
  - C. carbon dioxide, glucose, and protein
  - D. glucose, red blood cells, and amino acids
27. Samples of human blood were tested in a medical laboratory for a number of components. Tests with which of the following would be expected to yield NEGATIVE results?
- A. Sudan IV
  - B. Biuret solution
  - C. Iodine solution
  - D. Benedict's solution
28. Increasing the adrenalin content of the blood during a stressful situation would be expected to decrease the flow of blood to the
- A. skin
  - B. brain
  - C. heart
  - D. lungs

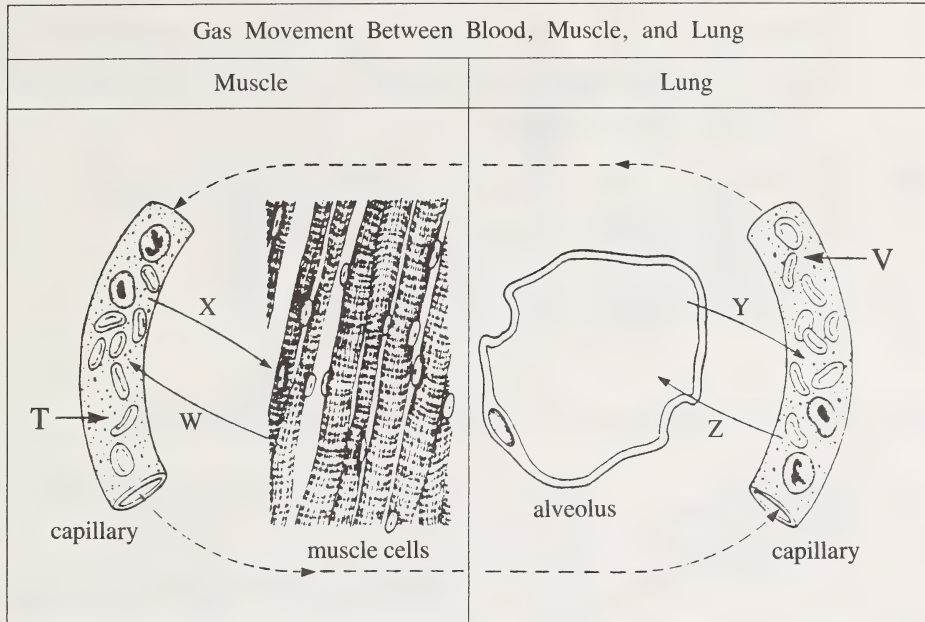
29. The lymphatic and venous transport systems both
- A. produce types of phagocytic white blood cells
  - B. return waste materials directly to the kidneys
  - C. rely on skeletal muscle contraction to move fluids
  - D. carry large numbers of oxygen-poor red blood cells

Use the following diagram to answer question 30.



30. Structures labelled W and X differ in that
- A. W is composed of rings of cartilage and is the site of gas exchange
  - B. W has walls that are one-cell thick and is the site of gas exchange
  - C. X is composed of rings of cartilage and is the site of gas exchange
  - D. X has walls that are one-cell thick and is the site of gas exchange

Use the following diagram to answer questions 31 and 32.



31. The labelled directional arrows represent the net movement of what gases?
- X and Y are oxygen; W and Z are carbon dioxide
  - X and Y are carbon dioxide; W and Z are oxygen
  - X and Z are oxygen; W and Y are carbon dioxide
  - X and Z are carbon dioxide; W and Y are oxygen
32. Which is a correct comparative description of the pH readings for plasma samples labelled T and V?
- Samples T and V are equal in pH because of the process of breathing.
  - Sample T has a higher pH than Sample V because Sample T is lower in  $\text{CO}_2$ .
  - Sample T has a lower pH than Sample V because Sample T is higher in  $\text{CO}_2$ .
  - Samples T and V are unaffected by gas exchange because dissolved gases do not form acids or bases in blood.

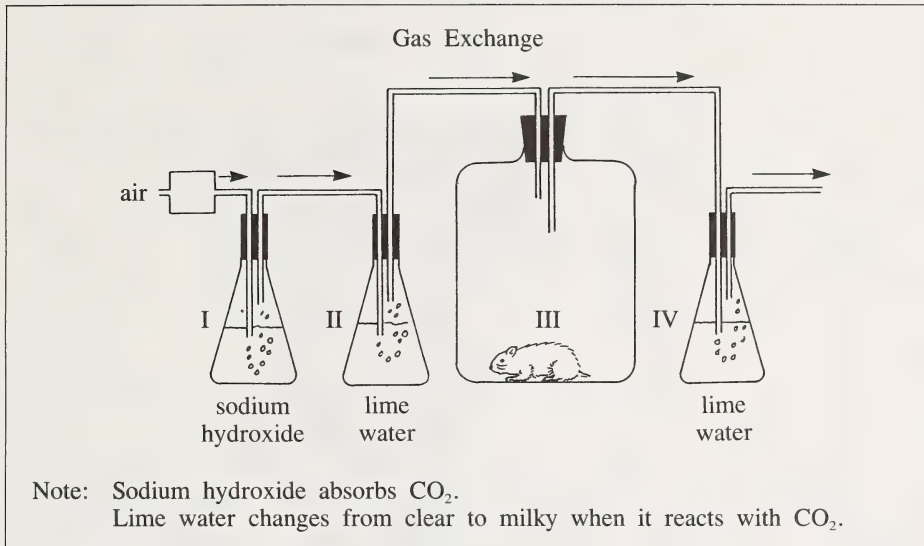


Use the following information to answer question 33.

A lipid-protein mixture called “surfactant” is secreted by special cells in the alveoli. This mixture reduces surface tension, thereby allowing the alveoli to enlarge. Premature babies may not secrete enough surfactant, which results in “respiratory distress syndrome.”

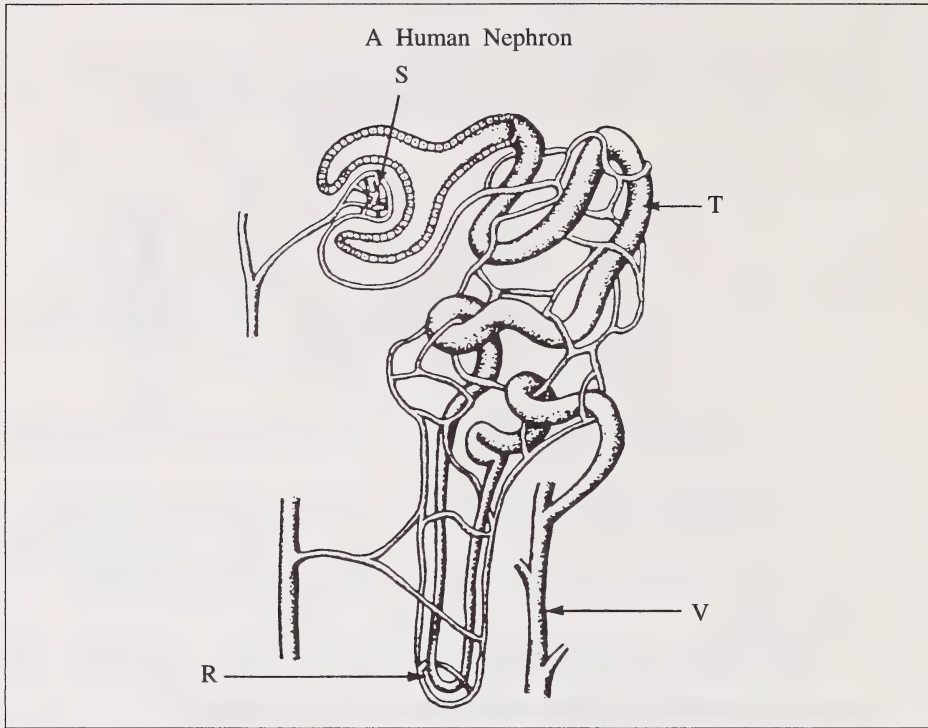
33. The condition that BEST describes the reason the syndrome occurs is
- A. excessive elasticity of the alveoli
  - B. excess fluid collecting in the alveoli
  - C. insufficient surface area for gas exchange
  - D. insufficient expansion of the thoracic cavity
- 
34. The material most readily used by the body in cellular respiration is
- A. glucose
  - B. glycogen
  - C. fatty acids
  - D. amino acids
35. During anaerobic respiration in muscle cells, the formation of lactic acid
- A. provides an alternative to the use of glucose in the production of large amounts of ATP
  - B. eliminates the production of carbon dioxide, resulting in a decreased breathing rate
  - C. allows small amounts of ATP to be produced in the absence of oxygen
  - D. increases the rate of muscular contraction
36. The end products of aerobic cellular respiration are
- A. water, carbon dioxide, and ADP
  - B. carbon dioxide, water, and ATP
  - C. carbon dioxide and water
  - D. water, oxygen, and ATP

Use the following diagram to answer questions 37 and 38.



37. If air were pumped through the apparatus, one would expect to observe which results?
- A. The lime water in flasks II and IV would turn milky.
  - B. The lime water in flasks II and IV would remain clear.
  - C. The lime water in Flask II would turn milky while the lime water in Flask IV would remain clear.
  - D. The lime water in Flask II would remain clear while the lime water in Flask IV would turn milky.
38. The function of Flask II is to show that the
- A. gas flow through the system is in one direction only
  - B. animal can survive in a  $\text{CO}_2$ -free atmosphere
  - C.  $\text{CO}_2$  is removed from the incoming air
  - D. animal uses  $\text{O}_2$  in respiration
-

Use the following diagram to answer questions 39 and 40.



39. Significantly reduced blood pressure would most directly affect the function of the region labelled
- A. R
  - B. S
  - C. T
  - D. V
40. A comparison of fluids found in the regions labelled T and V would reveal that T has a lower concentration of
- A. urea
  - B. glucose
  - C. proteins
  - D. amino acids
-



Use the following table to answer question 41.

Glomerular Filtrate Compared to Plasma and Urine			
Main Components	Fluid (g/100 mL)		
	Plasma	Glomerular Filtrate	Urine
Urea	0.030	0.030	2.000
Uric acid	0.004	0.004	0.050
Glucose	0.100	0.100	Trace
Amino acids	0.050	0.050	Trace
Total inorganic salts	0.720	0.720	1.500
Proteins and other macromolecules	8.000	0.000	0.000

41. The conclusion that nephrons selectively filter molecules from the plasma in the production of glomerular filtrate is supported by the results shown for
- A. urea
  - B. glucose
  - C. total inorganic salts
  - D. proteins and other macromolecules
- 
42. Kidneys play a major homeostatic role in regulating body fluids. Which would NOT be a reasonable inference?
- A. A person consuming a high amount of salty bacon for breakfast would be thirsty.
  - B. A carpenter working outdoors on a very hot day would probably have an increase in ADH secretion.
  - C. Consuming an overabundance of fluid in a day would result in low ADH secretion and very watery urine.
  - D. A person taking a 10-kilometre hike through very rough terrain would have a decrease in aldosterone secretion.

Use the following information to answer question 43.

The volume of urine excreted by an individual increased from 1500 mL/day to 2500 mL/day. There was no substantial amount of glucose or protein in the urine.

43. If the individual's blood were tested, one would expect to find
- A. low levels of ADH
  - B. high levels of ADH
  - C. low levels of insulin
  - D. high levels of aldosterone

Use the following information to answer question 44.

Four students numbered 1 to 4 were provided with a flow chart depicting the pathway of some nitrogenous compounds through the human body.



These same four students were asked to identify the functions that occurred in each of the structures W, X, Y, and Z. Their choices are recorded in the chart below.

Student number	Urea is concentrated in the urine	Amino acids are converted to urea and other products	Protein is converted to amino acids
1	Z	Y	W
2	Y	W	X
3	Z	W	X
4	Y	X	W

44. The student who correctly matched three of the structures with their respective functions is
- A. 1
  - B. 2
  - C. 3
  - D. 4

45. The artificial kidney machine is used to purify blood when the kidneys fail to do their work. A major functional difference between the artificial and the real kidney is that
- A. only the real kidney uses a semipermeable membrane
  - B. the artificial kidney cannot carry out active transport
  - C. the real kidney does not use diffusion to move molecules through a membrane
  - D. only the artificial kidney maintains a concentration gradient across a membrane
46. Most hormones produced by the endocrine glands are released directly into the
- A. lymph
  - B. blood
  - C. target cells
  - D. nervous system
47. How would eating a meal very high in carbohydrates affect a person's blood glucose and insulin levels after sufficient time has been allowed for digestion and absorption to occur?
- A. Both glucose and insulin levels would be lower.
  - B. Both glucose and insulin levels would be higher.
  - C. Glucose levels would be unchanged while insulin levels would be higher.
  - D. Glucose levels would be higher while insulin levels would be unchanged.

Use the following information to answer question 48.

A regulatory mechanism involving a hormone is presented along with two conditions that may or may not be directly related to the regulatory mechanism.

Regulatory Mechanism

Thyroxin  
levels

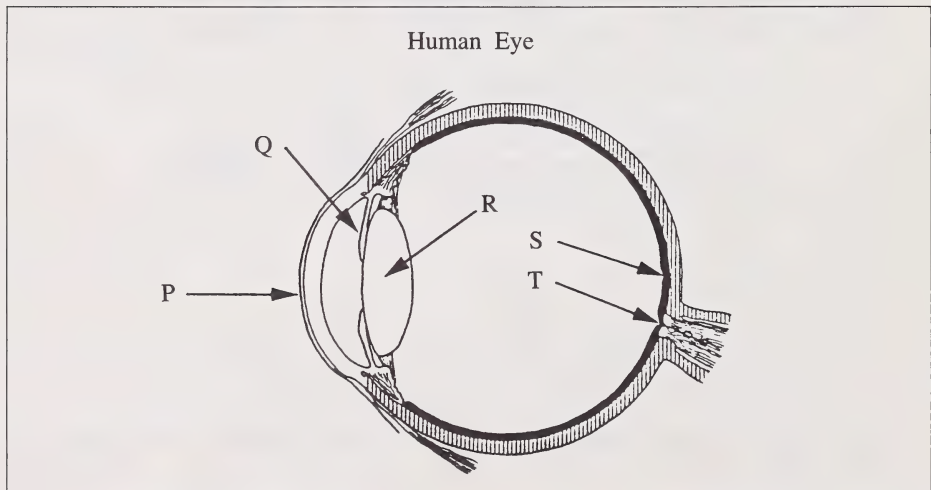
Condition

First – Surgical removal of a person's pituitary requires administration of pituitary hormones to increase metabolic rate.

Second – Drinking large amounts of alcohol results in a marked increase in urine excretion.

48. Which statement correctly identifies the relationship between the regulatory mechanism and the two conditions?
- A. The regulatory mechanism is related to both conditions.
  - B. The regulatory mechanism is not related to either condition.
  - C. The regulatory mechanism is related to the first condition but not the second.
  - D. The regulatory mechanism is related to the second condition but not the first.

Use the following diagram to answer question 49.

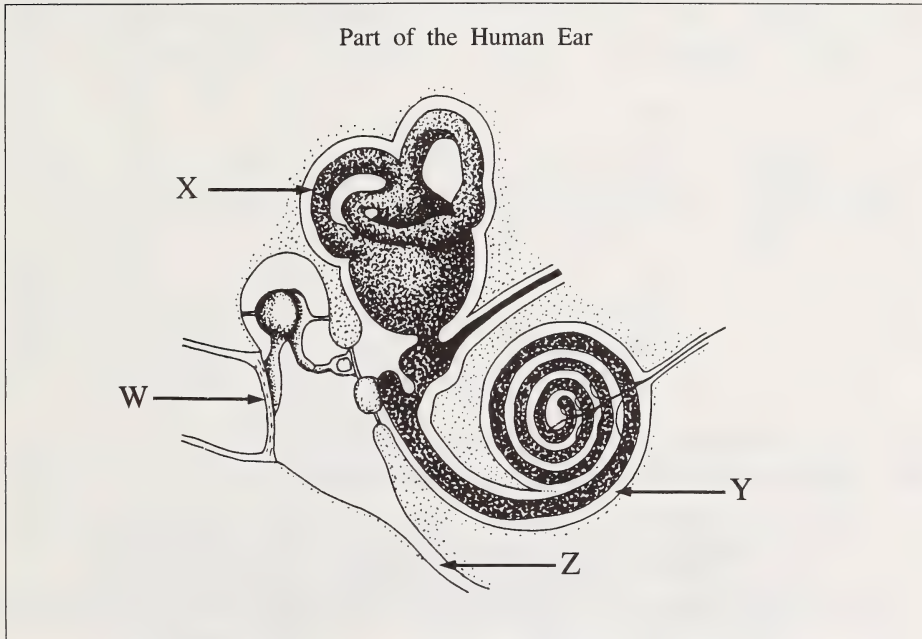


49. TWO labelled structures that respond to changes in light intensity are
- A. P and Q
  - B. P and R
  - C. S and Q
  - D. S and T



50. Which statement concerning visual problems is FALSE?
- A. In nearsightedness, the image focuses behind the retina.
  - B. Astigmatism is caused by uneven curvature of the cornea or lens.
  - C. Night blindness is caused by chemical deficiencies in the rods.
  - D. The lens becomes less flexible with age causing a loss of ability to focus on near objects.

Use the following diagram to answer questions 51 and 52.



51. Pressure in the middle ear is adjusted by the
- A. semicircular canals, labelled Y
  - B. semicircular canals, labelled X
  - C. eustachian tube, labelled Z
  - D. eustachian tube, labelled W
52. Sound waves are transmitted from the eardrum through the middle ear by
- A. the cochlea
  - B. bones (ossicles)
  - C. the auditory nerve
  - D. semicircular canals
-

Use the following information to answer question 53.

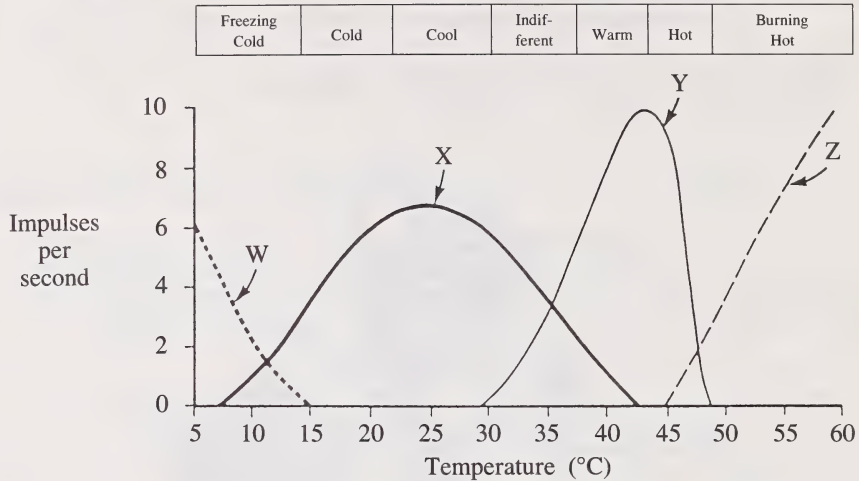
The graph illustrates the effects of different temperatures on the responses of four different nerve fibres in the skin:

W – a pain receptor stimulated by cold

Y – a heat receptor

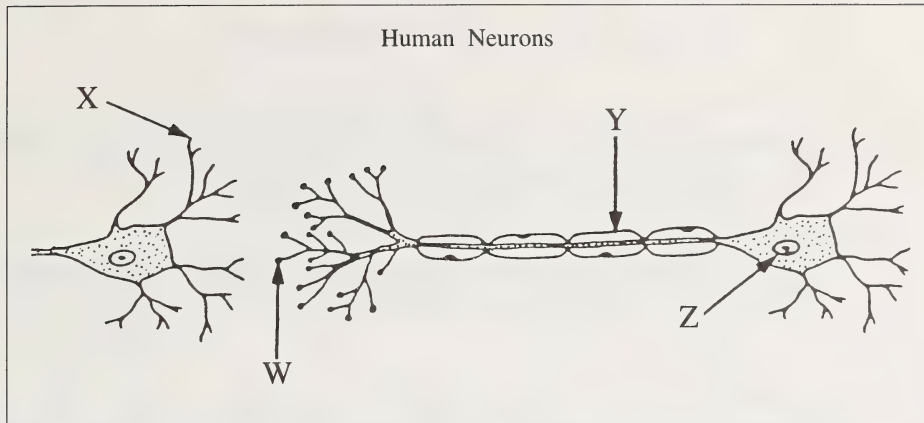
X – a cold receptor

Z – a pain receptor stimulated by heat



53. Which interpretation of the graph is INCORRECT?
- At 35°C both heat and cold receptors are stimulated equally.
  - A temperature of 5°C is less painful than a temperature of 50°C.
  - Cold receptors are sensitive to the greatest range in temperature.
  - As the temperature rises from 10°C to 15°C, pain impulses cease and cold receptors begin to function.
- 
54. Impulses are transmitted at the synapse by
- ATP
  - sodium ions
  - acetylcholine
  - electron transport
55. The sequence that correctly describes the transmission of a nerve impulse is
- effector, motor neuron, sensory neuron, receptor
  - receptor, sensory neuron, motor neuron, effector
  - effector, sensory neuron, motor neuron, receptor
  - receptor, motor neuron, sensory neuron, effector

Use the following diagram to answer question 56.



56. The structure that increases the rate of conduction of a nerve impulse is labelled

- A. W
- B. X
- C. Y
- D. Z

Use the following information to answer question 57.

Brain Functions

- I. Regulation of body temperature and glandular secretions
- II. Regulation of heartbeat and blood pressure
- III. Regulation of motor impulses that stimulate or inhibit skeletal muscles at appropriate times
- IV. Storage of information accumulated from senses such as hearing, sight, touch, etc.

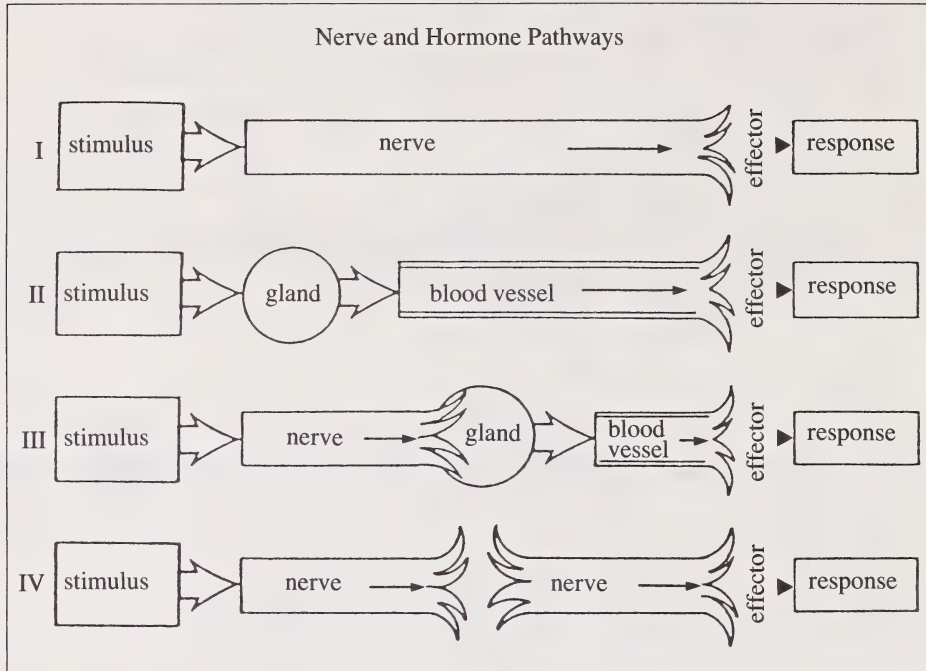
Brain Structure

- W. cerebrum
- X. cerebellum
- Y. hypothalamus
- Z. medulla oblongata

57. The best match of functions I, II, III, and IV with their respective structures would be

- A. W, Y, X, and Z
- B. Y, X, Z, and W
- C. Y, Z, X, and W
- D. Z, Y, W, and X

Use the following flow diagrams to answer questions 58 and 59.



58. The sight of a frightening object causes the release of adrenalin within a person's body. As a result, the person's heart rate increases. Which pathway outlines the person's regulatory sequence?

- A. I
- B. II
- C. III
- D. IV

59. The method that usually brings about control most quickly is

- A. I, because it involves less synaptic transmission
- B. II, because circulation occurs faster than impulse transmission
- C. III, because there are fewer synapses
- D. IV, because more neurons are involved



Use the following information to answer question 60.

Hypothetical Functions of Skeletal Parts

- I. Produce blood cells
- II. Store various inorganic salts
- III. Act as levers that aid body movements
- IV. Supply reservoirs for the storage of antibodies
- V. Provide shape and support for body structures

60. All of the above are confirmed functions of the skeletal parts EXCEPT
- A. I
  - B. I and II
  - C. III and IV
  - D. IV
- 
61. Which is NOT a major function of semen?
- A. Supplying hormones and enzymes for the fertilized egg
  - B. Buffering the acidic environment within the vagina
  - C. Providing a swimming medium for the sperm cell
  - D. Providing nutrients for the sperm cell
62. The onset of labor in the birth process is accompanied by a drop in the level of
- A. relaxin
  - B. estrogen
  - C. oxytocin
  - D. progesterone

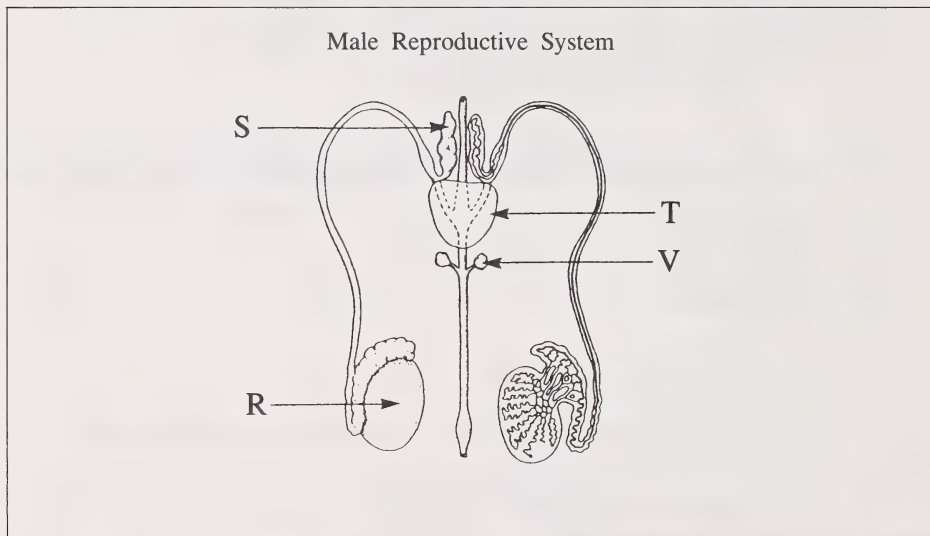
Use the following information to answer question 63.

Some of the following structures are part of the human male reproductive system.

- I. ureter
- II. urethra
- III. epididymis
- IV. vas deferens
- V. seminiferous tubules

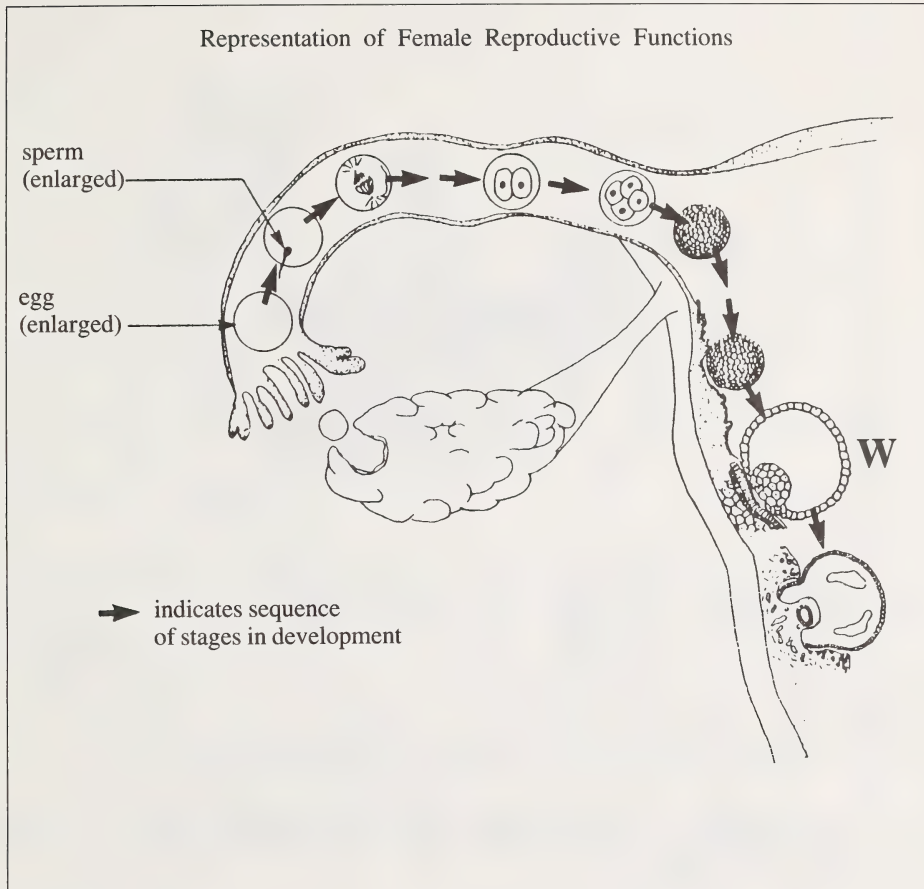
63. The correct sequence of structures through which sperm pass from the site of production to the outside of the body is
- A. III, V, IV, and I
  - B. IV, III, V, and II
  - C. V, III, IV, and II
  - D. V, IV, III, and I
- 

Use the following diagram to answer question 64.



64. Growth of muscle tissue is promoted by secretions from the structure labelled
- A. R
  - B. S
  - C. T
  - D. V
-

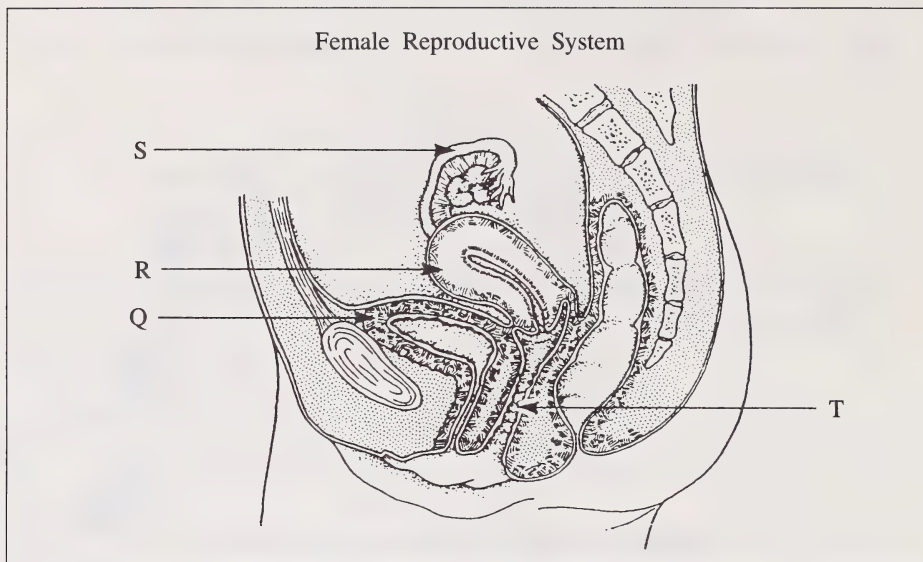
Use the following diagram to answer question 65.



65. The name of the process represented at W is

- A. ovulation
- B. implantation
- C. fertilization
- D. follicular development

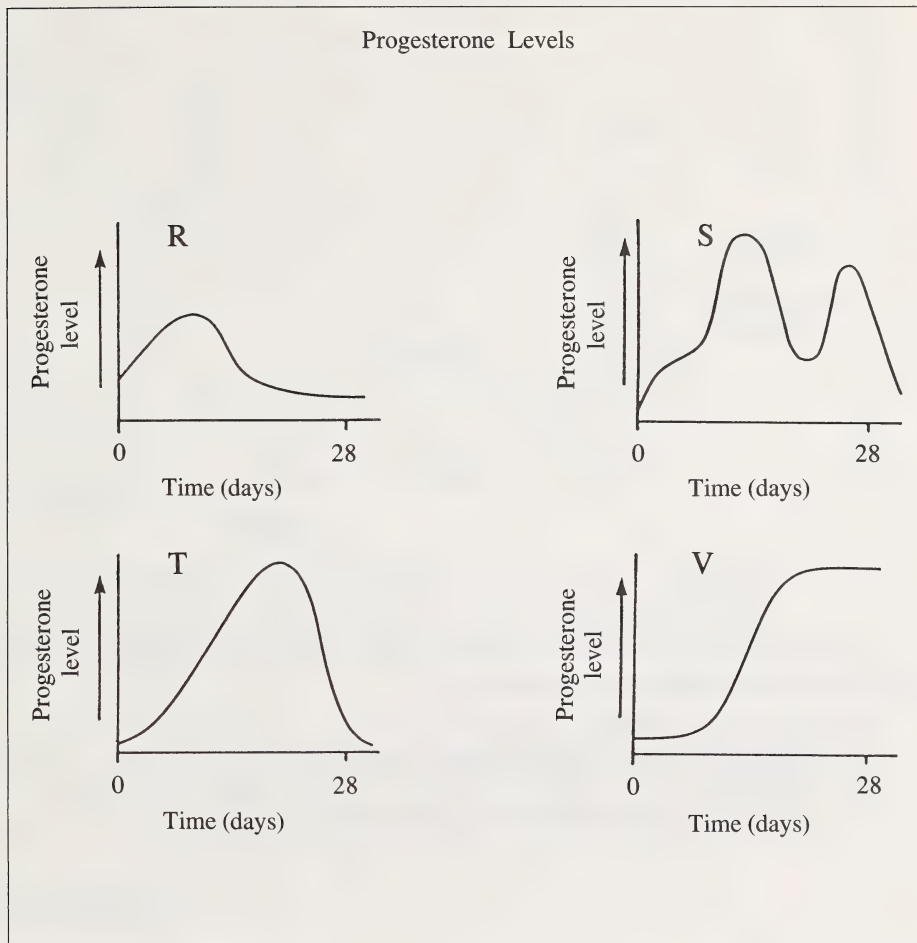
Use the following diagram to answer question 66.



66. Oxytocin causes contractions in the structure labelled
- A. Q
  - B. R
  - C. S
  - D. T
- 
67. In fetal circulation, the GREATEST oxygen concentration is found in the blood vessel leading from the
- A. fetus to the mother
  - B. placenta to the fetus
  - C. fetus to the placenta
  - D. lungs of the fetus to its heart
68. Which sequence represents the normal female reproductive cycle starting at Day 1?
- A. Ovulation → follicle formation → menstruation → corpus luteum formation
  - B. Follicle formation → corpus luteum formation → ovulation → menstruation
  - C. Corpus luteum formation → follicle formation → ovulation → menstruation
  - D. Menstruation → follicle formation → ovulation → corpus luteum formation



Use the following graphs to answer question 69.

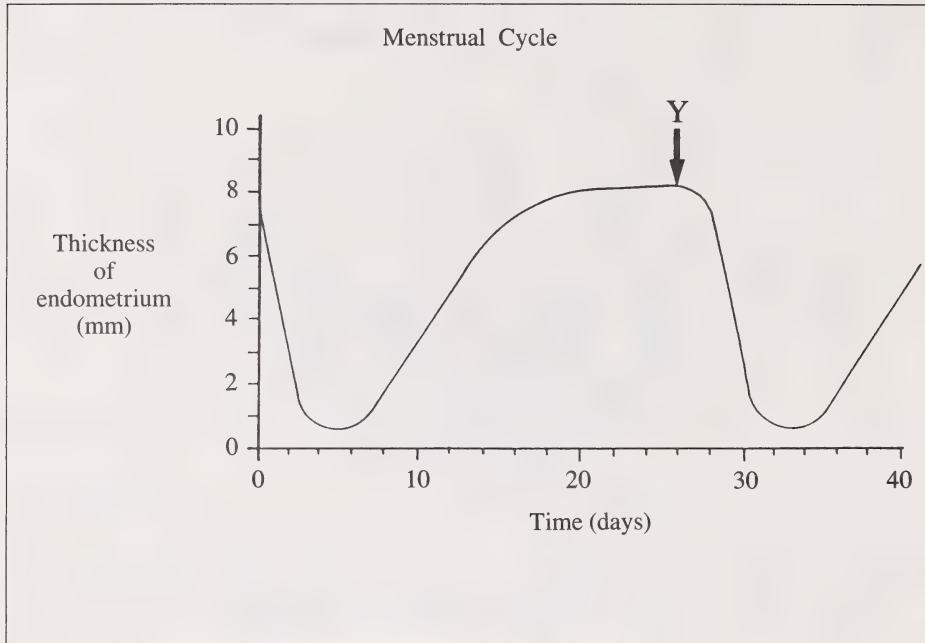


69. Which graph illustrates progesterone levels if the ovum is NOT fertilized?

- A. R
- B. S
- C. T
- D. V

\_\_\_\_\_

Use the following graph to answer question 70.



70. What occurs at the time indicated by Y?
- A. The follicle undergoes ovulation.
  - B. The follicle secretes more estrogen.
  - C. The corpus luteum begins to function.
  - D. The corpus luteum secretes less progesterone.
- 

**YOU HAVE NOW COMPLETED THE MULTIPLE-CHOICE SECTION OF THE EXAMINATION. PLEASE PROCEED TO THE NEXT PAGE AND ANSWER THE WRITTEN-RESPONSE QUESTIONS IN PART B.**

## **PART B**

### **INSTRUCTIONS**

Please write your answers in the examination booklet as neatly as possible.

Communicate your answers in clear, concise sentences. Marks will be awarded for pertinent explanations and answers.

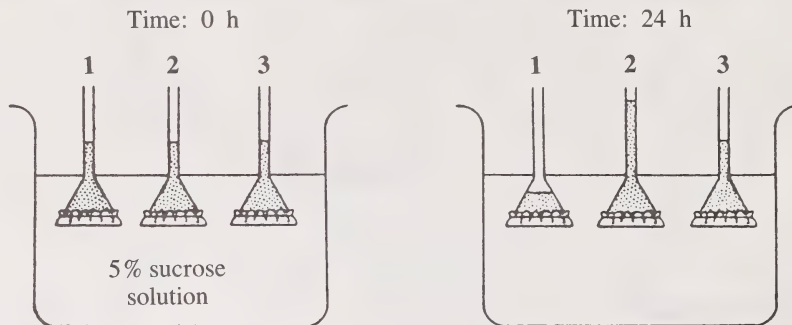
<p>NOTE: The perforated pages at the back of this booklet may be torn out and used for your rough work.</p>
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**TOTAL MARKS: 30**

**START PART B IMMEDIATELY**

Use the following information to answer question 1.

Dialysis tubing, which is impermeable to sucrose, was securely tied over the wide end of each of three funnels, numbered 1, 2, and 3. An equal volume of sucrose solution of different concentrations was placed in each of the funnels. The three funnels and their contents were then placed in a 5% sucrose solution. After 24 hours, the level of the solution in each funnel was noted.



(6 marks)

- On the basis of the results illustrated, estimate the concentration of the solutions initially placed into each of the funnels. Using complete sentences, justify your estimate with an explanation.

Funnel 1 \_\_\_\_\_

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Funnel 2 \_\_\_\_\_

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Funnel 3 \_\_\_\_\_

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Use the following description of a laboratory procedure  
to answer question 2.

Ten millilitres of a cloudy egg-white suspension were added to each of five test tubes labelled A, B, C, D, and E. The following additions were made to the test tubes:

Tube A - 1 mL of pepsinogen solution

Tube B - 1 mL of distilled water and 5 drops of dilute HCl

Tube C - 1 mL of pepsinogen solution and 5 drops of dilute HCl

Tube D - 1 mL of pepsinogen solution that had been previously boiled and then cooled, and 5 drops of dilute HCl

Tube E - 1 mL of distilled water

The test tubes and their contents were placed in a water bath at 37°C. After sufficient incubation time, the tubes were withdrawn from the water bath and examined for differences in the cloudiness of the suspension.

NOTE: Digested protein solution is clear, undigested protein suspension is cloudy.

2. Predict the appearance of the contents of each test tube and explain why digestion has or has not occurred. (Use complete sentences to present your answers.)

(5 marks)

Tube A: \_\_\_\_\_

\_\_\_\_\_

Tube B: \_\_\_\_\_

\_\_\_\_\_

Tube C: \_\_\_\_\_

\_\_\_\_\_

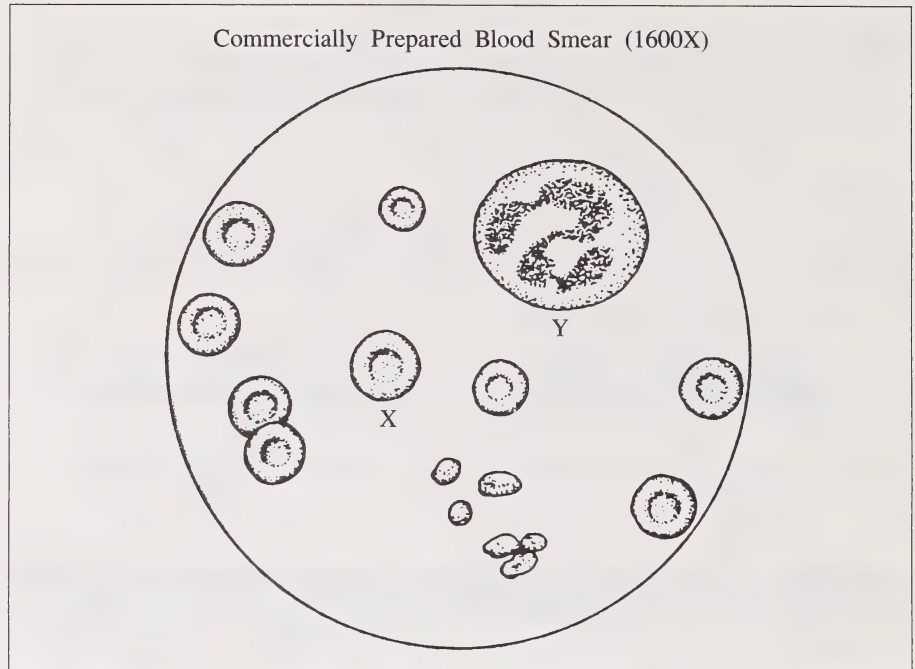
Tube D: \_\_\_\_\_

\_\_\_\_\_

Tube E: \_\_\_\_\_

\_\_\_\_\_

Use the following diagram to answer question 3.



(4 marks)

3. a. Using complete sentences, name the cell labelled X and describe ONE of its functions.

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- b. Using complete sentences, describe TWO functions of the class of cells to which the specific cell labelled Y belongs.

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Use the following chart to answer question 4.

A Comparison of Inhaled and Exhaled Air			
Type of Air	Gas (% by Volume)		
	Oxygen	Carbon Dioxide	Water Vapor
Inhaled Air	20.80	0.04	1.25
Exhaled Air	15.60	4.00	5.90

4. Using complete sentences, explain the difference between inhaled and exhaled air for each gas in the chart.

(3 marks)

a. oxygen \_\_\_\_\_

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b. carbon dioxide \_\_\_\_\_

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c. water vapor \_\_\_\_\_

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**(3 marks)**

5. Several systems perform excretory functions by removing metabolic wastes and regulating salt and water balance. Select **THREE** organs from these systems and, using complete sentences, describe **ONE** excretory function of each.

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**(6 marks)**

6. How would an increase in each of the following hormones change blood glucose levels? Using complete sentences, explain how each hormone brings about such a change.

a. thyroxin \_\_\_\_\_

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b. insulin \_\_\_\_\_

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c. adrenalin \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

7. Using complete sentences, describe THREE important functions of the placenta that provide for the development of the fetus.

(3 marks)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
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**YOU HAVE NOW COMPLETED THE EXAMINATION. IF YOU HAVE TIME,  
YOU MAY WISH TO GO BACK AND CHECK YOUR ANSWERS.**





(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION



(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

FOLD AND TEAR ALONG PERFORATION





(NO MARKS WILL BE GIVEN FOR WORK DONE ON THIS PAGE)

TEAR-OUT  
SHEET

FOLD AND TEAR ALONG PERFORATION

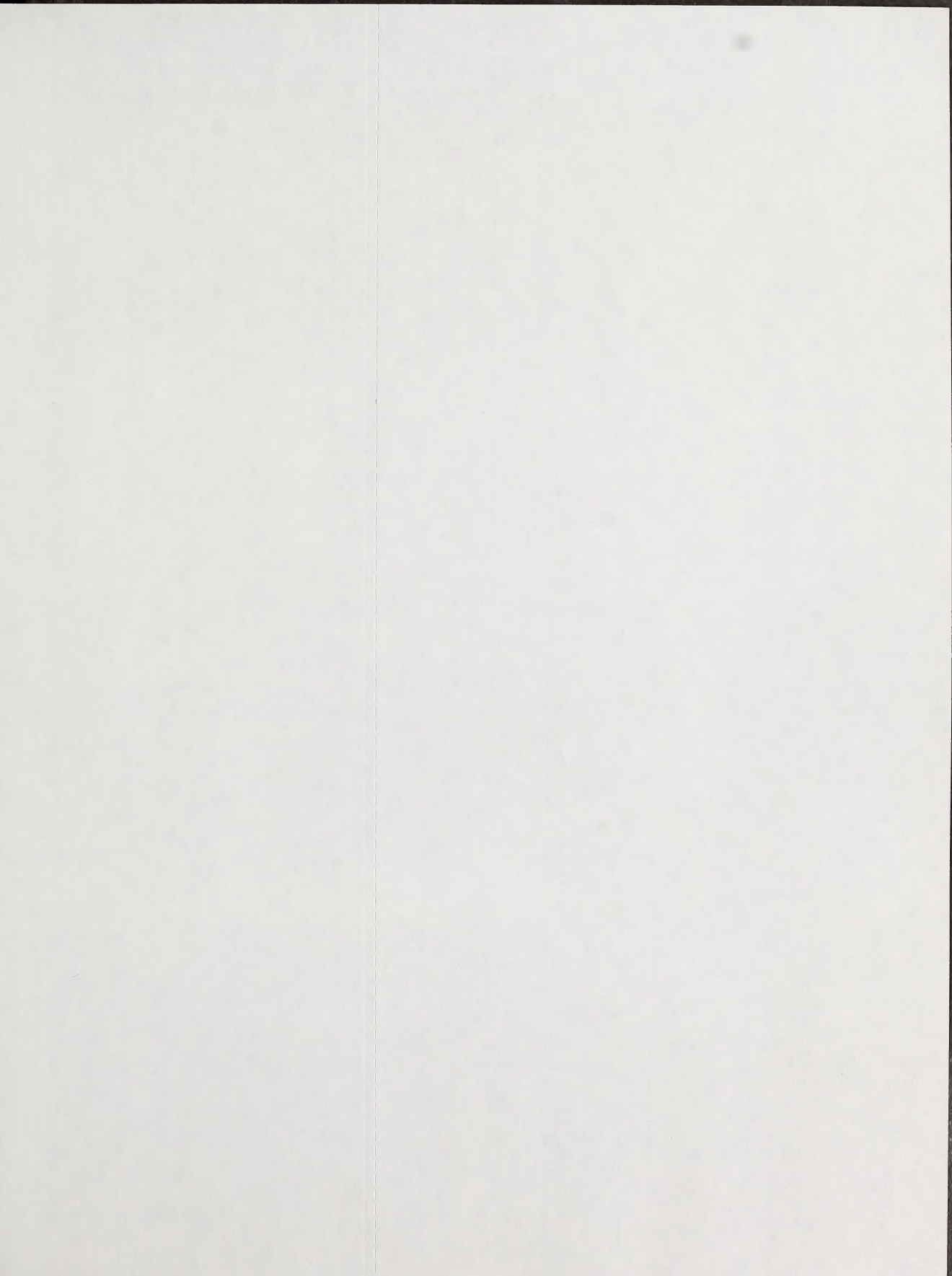


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TEAR-OUT  
SHEET

FOLD AND TEAR ALONG PERFORATION







**FOR DEPARTMENT USE ONLY**

M1 ☐

M2 ☐

M3 ☐

M4 ☐

**FOR DEPARTMENT USE ONLY**

BIOLOGY 30

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BIOLOGY 30